AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A method of matched filtering comprising:

computing the Fourier transform of a signal to be filtered;

computing the Fourier transform of a reference sequence to which the filter is to be matched; and

forming the product of the two transforms;

characterised in that the reference sequence is defined by a process of iteratively combining shifted versions of shorter sequences and the step of computing the Fourier transform of the reference sequence comprises an iterative process of combining the Fourier transforms of a shorter starting sequence.

2. (original) A method according to claim 1 in which the reference sequence is a Golay sequence pair and the step of forming the Fourier transform of the reference sequence comprises repeatedly:

(a) combining the Fourier transform of a first member of a Golay pair with the Fourier transform of the second member of that Golay pair to produce a first member of a new Golay pair; and

(b) combining the Fourier transform of a first member of a Golay pair with the Fourier transform of the second member of that Golay pair to produce a second member of a new Golay pair.

3. (original) A method according to claim 2 in which said combining uses only the operations of inverting, addition, and multiplication by $\exp(\pm j2\pi f\Phi)$, where f is frequency and Φ is a shift value dependent on the length of the sequence.

4. (currently amended) A method according to claim 3 in which the transforms $A_K(f)$, $B_K(f)$ of a Golay pair are formed ~~form~~ from the transforms $A_{K-1}(f)$, $B_{K-1}(f)$ of a shorter such pair according to the relationships

$$A_K(f) := A_{K-1}(f)\exp(+j2\pi\Phi f) + B_{K-1}(f)\exp(-j2\pi\Phi f)$$

$$B_K(f) := A_{K-1}(f)\exp(+j2\pi\Phi f) - B_{K-1}(f)\exp(-j2\pi\Phi f)$$

where Φ is half the length of each member of the shorter pair, and f is frequency.

5. (original) A method according to claim 3 in which the transforms $A_K(f)$, $B_K(f)$ of a Golay pair are formed from the transforms $A_{K-1}(f)$, $B_{K-1}(f)$ of a shorter such pair according to the relationships

$$A_K(f) := A_{K-1}(f)\exp(+j2\pi\theta f_{K-1}f) + B_{K-1}(f)\exp(-j2\pi\theta_{K-1}f)$$

$$B_K(f) := A_{K-1}(f)\exp(+j2\pi\theta_{K-1}f) - B_{K-1}(f)\exp(-j2\pi\theta_{K-1}f)$$

where θ are time intervals dependent on the number of iterations, and f is frequency.

6. (currently amended) A method according to claim 4 ~~or 5~~ in which the iteration commences with a Golay pair each member of which has a length of 1.

7. A method according to claim 2 in which said combining uses only the operations of inverting, addition, and multiplication by $\exp(\pm j2\pi f\Phi)$ where f is frequency and Φ is a shift value dependent on the length of the sequence

8. (currently) A method according to claim 7 in which the transforms $A_K(f)$, $B_K(f)$ are formed ~~form~~ from the transforms $A_{K-1}(f)$, $B_{K-1}(f)$ of a shorter such pair according to the relationships

$$A_K(f) := A_{K-1}(f) \exp(+j2\pi\Phi f) + B_{K-1}(f) \exp(-j2\pi\Phi f)$$

$$B_K(f) := A_{K-1}(f) \exp(+j2\pi\Phi f) + B_{K-1}(f) \exp(-j2\pi\Phi f)$$

where Φ is half the length of each member of the shorter pair, and f is frequency.

9. (original) A method according to claim 7 in which the transforms $A_K(f)$, $B_K(f)$ are formed from the transforms $A_{K-1}(f)$, $B_{K-1}(f)$ of a shorter such pair according to the relationships

$$A_K(f) := A_{K-1}(f) \exp(+j2\pi\theta_{K-1}f) + B_{K-1}(f) \exp(-j2\pi\theta_{K-1}f)$$

$$B_K(f) := A_{K-1}(f) \exp(+j2\pi\theta_{K-1}f) - B_{K-1}(f) \exp(-j2\pi\theta_{K-1}f)$$

where θ are time intervals dependent on the number of iterations, and f is frequency.

10. (currently amended) A method according to ~~any one of the preceding claims~~ claim 1 including the step of forming the inverse Fourier transform of the product.